

## We Claim:

## 1. A curable sealant composition comprising:

- 5 a. a polymer including at least conjugated diene contributed monomer units in a backbone of said polymer, and said polymer further having terminal groups including silicon, and
- b. other necessary curable sealant ingredients selected from the group consisting of plasticizers, fillers, reinforcing agents, modifiers, curing catalysts/hardeners, stabilizers, and mixtures thereof, wherein the polymer has a 1,2-microstructure content of 40-70%, a weight average molecular weight ( $M_w$ ) of 10,000-60,000  
10 and a polydispersity of less than about 1.8.

## 2. A process for forming a curable sealant comprising:

- 15 a. forming a polymer having a 1,2-microstructure content in the range of 40% to 70%, a weight average molecular weight ( $M_w$ ) in the range of 10,000 to 60,000, and a poly dispersity of less than 1.8 by
- 1) initiating a living polymerization of conjugated diene monomers with a multi-functional initiator, and
- 2) terminating said polymerization with a tetra-substituted silicon group, and
- 20 b. combining the polymer with necessary sealant ingredients selected from the group consisting of plasticizers, fillers, reinforcing agents, modifiers, curing catalysts/hardeners, stabilizers, and mixtures thereof.

3. A polymer comprising:

- a. at least conjugated diene contributed monomer units in a backbone of said polymer,
- b. said polymer further having terminal groups including silicon, and
- c. wherein the polymer has a 1,2-microstructure content of 40 to 70%, a weight average molecular weight ( $M_w$ ) of 10,000 to 60,000 and a polydispersity of less than 1.8.

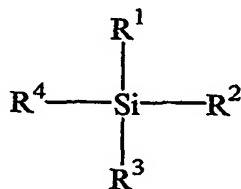
4. A process for forming a polymer comprising:

- 1) initiating a living polymerization of conjugated diene monomers with a multi-functional initiator, and
- 2) terminating said polymerization with a tetra-substituted silicon group, and

wherein said polymer has a 1,2-microstructure content in the range of 40% to 70%, a weight average molecular weight ( $M_w$ ) in the range of 10,000 to 60,000, and a poly dispersity of less than 1.8.

5. The polymer described and claimed in claims 1-4 wherein said conjugated diene contributed monomer units are selected from the group consisting of 1,3-butadiene, isoprene, 1,3-pentadiene, 2,3-dimethyl-1,3-butadiene, 1,3-hexadiene, 2-methyl-1,3-pentadiene, 3,4-dimethyl-1,3-hexadiene, 4,5-diethyl-1,3-octadiene, 3-butyl-1,3-octadiene, phenyl-1,3-butadiene, and mixtures thereof.

6. The polymer described and claimed in claims 1-5, wherein the polymer backbone further includes additional monomer units selected from the group consisting of vinyl aromatic hydrocarbon monomers, ethylene oxide, propylene oxide, styrene oxide, ethylene sulfide, propylene sulfide, styrene sulfide, acetaldehyde, propionaldehyde, isobutyraldehyde, n-  
5 caproaldehyde, acetthioaldehyde, propionthioaldehyde, isbutyrthioaldehyde, n-caprothioaldehyde, 3-dimethyl-oxycyclobutane, 3-diethyloxycyclobutane, 3-methylethyl-oxycyclobutane, 3-dimethylthiocyclobutane, 3-diethyl-thiocyclobutane, 3-methylethylthiocyclobutane, methylethyl thioketone, methyl isopropyl thioketone and diethyl thioketone, heterocyclic nitrogen containing monomers, and mixtures thereof.
- 10 7. The polymer described and claimed in claims 1-6 wherein said polymer backbone further includes at least one initiator residue.
8. The polymer described and claimed in of claims 1-7 wherein said initiator residue is  
15 derived from a multi-functional initiator.
9. The polymer described and claimed in of claims 1-8 wherein said terminal groups are the reaction product of the polymer backbone with a terminating group of the general structure:



wherein  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  are independently selected from the group consisting of hydrocarbon, alkoxy groups, and mixtures thereof.

10. The polymer described and claimed in claims 9 or 10 wherein no more than three of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  may be hydrocarbon.

11. The polymer described and claimed in claim 9 wherein at least one of  $R^1$ ,  $R^2$ ,  $R^3$ , and  $R^4$  comprises an alkoxy group.

12. The polymer described and claimed in claim 11 wherein said alkoxy groups are selected from the group consisting of methoxy, ethoxy, propoxy, butoxy, pentoxy, alkoxy groups with up to about 10 carbons, and mixtures thereof.

13. The polymer described and claimed in claim 9 wherein said hydrocarbon groups are selected from the group consisting of methyl, ethyl, propyl, butyl, pentyl-, hexyl-, heptyl-, octyl-, nonyl-, decyl-, and mixtures thereof.

14. A curable sealant comprising:

- a. a poly(conjugated diene) backbone with a  $M_w$  of 5,000 to 60,000, and at least one alkoxy silane end group, and
- b. other necessary sealant ingredients selected from the group consisting of plasticizers, fillers, reinforcing agents, modifiers, curing catalysts/hardeners, stabilizers, and mixtures thereof.